Alg. 2 Warm Up #11-4

1. Divide: $(6x^3 + 7x^2 - 16x + 18) \div (2x + 5)$

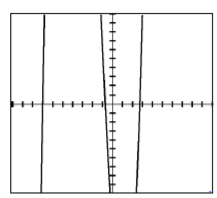
2. What does it mean when you get a remainder?

3. What does it mean when you don't?

Preview

HW Questions:

8-120. Carlos is always playing games with his graphing calculator, but now his calculator has contracted a virus. The TRACE, ZOOM, and WINDOW functions on his calculator are not working. He needs to solve $x^3 + 5x^2 - 16x - 14 = 0$, so he graphs $y = x^3 + 5x^2 - 16x - 14$ and sees the graph at right in the standard window.



a. From the graph, what appears to be an integer solution to the equation?

b. Check your answer from part (a) in the equation.

c. Since $x = -7$ is a solution to the equation, what is the factor associated with this solution?

d. Use polynomial division to find the other factor.

e. Use your new factor to complete this equation:

$$x^3 + 5x^2 - 16x - 14 = (x + 7)(\textit{other factor}) = 0$$

$(x^2 - 2x - 2)$

f. The "other factor" leads to two other solutions to the equation. Find these two new solutions and give all three solutions to the original equation.

$x^2 - 2x - 2 = 0$

$x^2 - 2x + 1 = 2 + 1$

$\sqrt{(x-1)^2} = \sqrt{3}$

$x - 1 = \pm\sqrt{3}$

$x = 1 \pm \sqrt{3}$

8-121. Now Carlos needs to solve $2x^3 + 3x^2 - 8x + 3 = 0$, but his calculator will still only create a standard graph. He sees that the graph of $y = 2x^3 + 3x^2 - 8x + 3$ crosses the x-axis at $x = 1$. Find all three solutions to the equation.

$\rightarrow (2x-1)(x+3)$

$x = 1, \frac{1}{2}, -3$

8-122. Without actually multiplying, decide which of the following polynomials could be the product of $(x-2)(x+3)(x-5)$. Justify your choice.

~~a.~~ $x^3 - 4x^2 - 11x - 5$

~~b.~~ $2x^3 - 4x^2 - 11x + 30$

c. $x^3 - 4x^2 - 11x + 30$

~~d.~~ $2x^3 - 4x^2 - 11x - 5$

8-123. Which of the following binomials could be a factor of $x^3 - 9x^2 + 19x + 5$? Explain your reasoning.

a. $x - 2$

b. $x - 5$

c. $x + 3$

d. $x + 2$

8-124. Now divide $x^3 - 9x^2 + 19x + 5$ by the factor that you chose in the preceding problem. If it is a factor, use it and the resulting factor to find all the zeros of the polynomial. If it is not a factor, reconsider your answer to the preceding problem and try a different factor.

8-125. Consider the equation $5x^2 - 7x - 6 = 0$ as you answer the questions in parts (a) through (d) below.

a. What are the factors of $5x^2 - 7x - 6$? $(5x+3)(x-2)$

$1 \cdot 6$
$2 \cdot 3$

b. What are the solutions to the equation?

c. Explain the relationship between the factors of the polynomial expression and the solutions to the equation.

d. How are the solutions to the equation related to the lead coefficient and constant term in the original polynomial?

$x = -\frac{3}{5}, 2$

$$\boxed{\text{possible solutions} = \frac{\text{all factors of constant}}{\text{all factors LC}}}$$

8-127. This problem is a checkpoint for solving and graphing inequalities. It will be referred to as Checkpoint 8A.

Graph the inequality in part (a) and the system of inequalities in part (b).

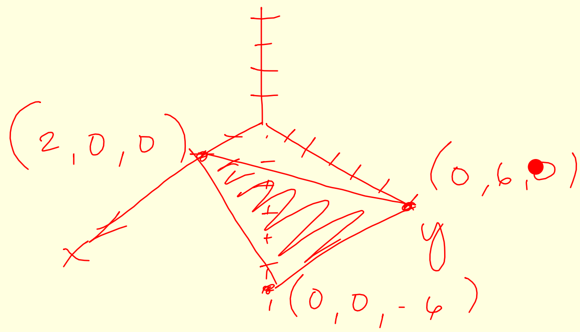
a. $|x+1| \geq 3$

b. $y \leq -2x + 3$
$y \geq x$
$x \geq -1$

8-128. Given the equation: $3x + y - z = 6$.

a. Draw a graph.

b. Is $(1, 2, -1)$ on the graph? Justify your answer.

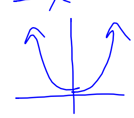


Tuesday's CP's

8-32. What can you say about the graphs of polynomial functions with an even degree compared to the graphs of polynomial functions with an odd degree? Use graphs from the Polynomial Functions Investigation (and maybe some others) to justify your response.

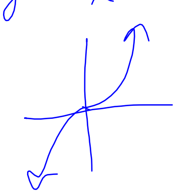
If even degree polynomial, end behavior is the same.

$y = x^2$



If odd degree polynomial end behavior is opposite.

$y = x^3$



8-35. Without using a calculator, sketch rough graphs of the following functions.

a. $P(x) = -x(x+1)(x-3)$

b. $P(x) = (x-1)^2(x+2)(x-4)$

c. $P(x) = (x+2)^3(x-4)$

Yesterday's Classwork:

5) $f(x) = 3x^3 + 10x^2 - 27x - 10$

Possible factors to get -10: $(x+1)(x-10)$ $(x+2)(x-5)$

What about the leading coefficient 3?

We need $(3x \quad)(x$

Given that $(3x+1)$ is a factor of $f(x)$, use long ÷ to help find all the factors of $f(x)$

$3x+1\overline{)\qquad\qquad}$

$(3x+1)(x^2+3x-10)$

$(3x+1)(x+5)(x-2)$

6) For $(x^4-6x^3+18x-4)\div(x-2)$ use a place holder for the missing x^2 term: $0x^2$

Do the division

$$
\begin{array}{r}
x^3-4x^2-8x+2 \\
x-2\overline{)\,x^4-6x^3+0x^2+18x-4}
\end{array}
$$

$$\frac{x^4-6x^3+18x-4}{x-2}=\boxed{x^3-4x^2-8x+2}$$

Week 11 Classwork

Warm up

8 - # 3 ---> 6 (purple)

8 - #26 ---> 30, 32, 35

Polynomial Division #1 (white)

Polynomial Division #2 (tan)
*Today's classwork

HW: Polynomial Summary
(green)